APPENDIX A

DESCRIPTION OF VIRGIN ACTIVATED CARBON

APPENDIX B

PERMITTED LIST OF HAZARDOUS WASTE

APPENDIX C

CARBON ACCEPTANCE PROCESS/FACILITY RECEIPT FLOW DIAGRAM

APPENDIX D

ADSORBATE PROFILE DOCUMENT

APPENDIX E

ANALYTICAL PARAMETERS AND RELEVANCE OF PROCEDURES

APPENDIX F

LOADING CALCULATION

Calculation of Carbon Loading

Adsorbate loadings on spent activated carbon are calculated using the following equations:

1. Calculation of Total Adsorbate Loading, %:

$$E = \frac{[A \times (1 - D)] - C}{C} \times 100$$

2. Calculation of Estimated Volatile Adsorbate Loading, %:

$$F = \frac{[A \times (1 - D)] - B}{B} \times 100$$

3. Calculation of Estimated Non-volatile Adsorbate Loading, %:

Loading = E - F

Where:

A = Spent Carbon Air Dried Apparent Density
B = Spent Carbon Oven Dried Apparent Density
C = Laboratory Reactivated Carbon Apparent Density
D = Decimal Value of Dean Stark Moisture
E = Total Adsorbate Loading from 1.
F = Estimated Volatile Adsorbate Loading from 2.

APPENDIX G

REACTIVE CYANIDE AND SULFIDE
TEST METHODS

APPENDIX H

IGNITABILITY
(METHOD RTM-10)

APPENDIX I

pH

APPENDIX J

APPARENT DENSITY

APPENDIX K

LABORATORY REACTIVATION

APPENDIX L

CARBON ACCEPTANCE SCREENING ANALYSIS

APPENDIX M

SPENT CARBON SHIPMENT SAMPLING PROCEDURES

SPENT CARBON SHIPMENT
SAMPLING PROCEDURE

This procedure outlines the sampling method for which all hazardous spent carbon samples will be taken from incoming shipments. The purpose of this procedure is to provide a sample for the facility screening analysis as defined in the waste analysis plan.

I. <u>Apparatus:</u>

a. Sampling Device: Manual soil probe for 12-inch core removal or shovel, where applicable. For samples obtained through bottom orifice of vessel, no sampling device may be necessary.

b. Sampling Receptacle: One quart, polyurethane wide-mouthed bottle, with screw lid.

c. Sample Label: Calgon Carbon Corporation's "Spent Carbon Sample" adhesive labels.

II. <u>Sampling Method:</u>

a. Bulk Trailers

(All bulk shipments must meet the acceptance criteria outlined in the waste analysis plan prior to unloading.)

1. Open the top bays of the trailer and select the bay where the carbon is mounded near its peak. This is usually the rear bay or the center bay.

2. Insert the soil probe 12 inches into the carbon bed and extract a sample, or obtain a sample at a depth of six to twelve inches using a clean shovel.

3. Transfer the sample into a one quart sample container and close tightly.

4. Label the sample using the "Spent Carbon Sample" adhesive labels.

5. Submit the sample to the foreperson and sign/date the screening sheet to act as a chain-of-custody form.

b. Service Units and Small Containers

(All service units and small containers must meet the acceptance criteria outlined in the waste analysis plan prior to unloading.)

1. Determine the number of units to be sampled using the following method:

Drums:	1 in 10, 2 in 20, etc.
Service Units:	1 in 5, 2 in 10, 3 in 15, etc.
Small Containers:	1 in 5, 2 in 10, 3 in 15, etc.

2. When feasible, a representative sample may be obtained through a bottom orifice of the container after purging a discretionary amount of carbon from the orifice.

3. When extracting a sample from the top of the container, insert the soil probe 12 inches into the carbon bed and extract a sample, or obtain a sample at a depth of six to twelve inches using a clean shovel. If necessary, a composite sample will be prepared in the laboratory from the samples taken.

4. Transfer the sample into a one quart sample container and close tightly.

5. Label the sample using the "Spent Carbon Sample" adhesive label.

6. Submit the sample(s) to the foreperson and sign/date the screening sheet to act as a chain-of-custody form.

APPENDIX N

CUSTOMER CERTIFICATION

CALGON CARBON CORPORATION
RECERTIFICATION OF GENERATOR'S SPENT CARBON

SECTION I. GENERAL INFORMATION

1. Generator Name: ___________________________

2. Facility Address: ___________________________

____

____

3. Phone: (   ) _______________

. Carbon Acceptance Number: ____________

5. USEPA Identification #: _________________

6. Waste Codes: ____________________________
(attach additional pages if needed).

Section II. PROCESS INFORMATION

1. Has the process changed: _______Yes _______No

2. Have you changed any raw materials used in the waste-generating process? _______Yes _______No

3. Are there any current analyses, i.e. TCLP, of the spent carbon? _______Yes _______No (If yes, please attach).

Section III. RECERTIFICATION

I certify under penalty of law that the information provided above is accurate and that the spent activated carbon, a RCRA classified hazardous waste, sent to the Calgon Carbon Corporation Neville Island regeneration facility was used in a manner previously described to Calgon Carbon for waste treatment. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Name of Responsible

Official__________________ Title___________

Signature__________________ Date___________

APPENDIX O

CHAIN OF CUSTODY FORM

APPENDIX P

COPY OF OUTSIDE TAPE

APPENDIX Q

MODULE NO. 1

APPENDIX R

CARBON ACCEPTANCE RESTRICTIVE PARAMETERS

APPENDIX S

SPENT CARBON SAMPLING PROCEDURES
INITIAL CHARACTERIZATION

APPENDIX T

TEST METHOD FOR THE DETERMINATION OF EXPLOSION POTENTIAL (DIFFERENTIAL SCANNING CALORIMETRY)

Facility Description
Section B

2 7388

APPENDIX B

Permitted List of Hazardous Waste

EPA Hazardous Waste Number	Contaminant/Description

D004.......... Arsenic
D005.......... Barium
D006.......... Cadmium
D007.......... Chromium
D008.......... Lead
D009.......... Mercury
D010.......... Selenium
D011.......... Silver
D012.......... Endrin
D013.......... Lindane
D014.......... Methoxychlor
D015.......... Toxaphene
D016.......... 2,4-D
D017.......... 2,4,5-TP (Silvex)
D018.......... Benzene
D019.......... Carbon Tetrachloride
D020.......... Chlordane
D021.......... Chlorobenzene
D022.......... Chloroform
D023.......... o-Cresol
D024.......... m-Cresol
D025.......... p-Cresol
D026.......... Cresol
D027.......... 1,4-Dichlorobenzene
D028.......... 1,2-Dichloroethane
D029.......... 1,1-Dichloroethylene
D030.......... 2,4-Dinitrotoluene
D031.......... Heptachlor (and its epoxide)
D032.......... Hexachlorobenzene
D033.......... Hexachlorobutadiene
D034.......... Hexachloroethane
D035.......... Methyl ethyl ketone
D036.......... Nitrobenzene
D037.......... Pentrachlorophenol
D038.......... Pyridine
D039.......... Tetrachloroethylene

D040.......... Trichoroethylene
D041.......... 2,4,5-Trichlorophenol
D042.......... 2,4,6-Trichlorophenol
D043.......... Vinyl Chloride

F001.......... The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F002.......... The following spent halogenated solvents: tetrachloro-ethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, orthodichlorobenzene, trichlorofluoro-methane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F003.......... The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F004.......... The following spent non-halogenated solvents: cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F005.......... The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F006.......... Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating carbon steel, and (6) chemical etching and milling of aluminum.

F007.......... Spent cyanide plating bath solutions from electroplating operations.

F008.......... Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.

F009.......... Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.

F010.......... Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.

F011.......... Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.

F012.......... Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process.

F019.......... Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process.

F024.......... Process wastes (including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. (This listing does not include wastewaters, wastewater treatment sludges, spent catalysts, and wastes listed in 261.31 or 261.32).

F025.......... Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.

F034.......... Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol. (Note: The listing of wastewaters that have not come into contact with process contaminants is stayed administratively, The stay will remain in effect until further administrative action is taken).

F035.......... Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol. (Note: The listing of wastewaters that have not come into contact with process contaminants is stayed administratively. The stay will remain in effect until further administrative action is taken.).

F037.......... Petroleum refinery primary oil/water/solids separation sludge - Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in: oil/water /solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated in aggressive biological treatment units as defined in 261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are exempted from this listing.

F038.......... Petroleum refinery secondary (emulsified) oil/water/solids separation sludge - Any sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in IAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated in aggressive biological treatment units as defined in 261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and F037, K048, and K051 wastes are exempted from this listing.

F039.......... Leachate resulting from the treatment, storage, or disposal of wastes classified by more than one waste code under Subpart D, or from a mixture of wastes classified under Subparts C and D of this part. (Leachate resulting from the management of one or more of the following EPA Hazardous Wastes and no other hazardous wastes retains its hazardous waste code(s): F020, F021, F022, F023, F026, F027, and/or F028.

K002.......... Wastewater treatment sludge from the production of chrome yellow and orange pigments.

K003.......... Wastewater treatment sludge from the production of molybdate orange pigments.

K004.......... Wastewater treatment sludge from the production of zinc yellow pigments.

K005.......... Wastewater treatment sludge from the production of chrome green pigments.

K006.......... Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).

K007.......... Wastewater treatment sludge from the production of iron blue pigments.

K008.......... Oven residue from the production of chrome oxide green pigments.

K009.......... Distillation bottoms from the production of acetaldehyde from ethylene.

K010.......... Distillation side cuts from the production of acetaldehyde from ethylene.

K011.......... Bottom stream from the wastewater stripper in the production of acrylonitrile.

K013.......... Bottom stream from the acetonitrile column in the production of acrylonitrile.

K014.......... Bottoms from the acetonitrile purification column in the production of acrylonitrile.

K015.......... Still bottoms from the distillation of benzyl chloride.

K016.......... Heavy ends or distillation residues from the production of carbon tetrachloride.

K017.......... Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.

K018.......... Heavy ends from the fractionation column in ethyl chloride production.

K019.......... Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.

K020.......... Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.

K021.......... Aqueous spent antimony catalyst waste from fluoromethanes production.

K022..........	Distillation bottom tars from the production of phenol/acetone from cumene.
K023..........	Distillation light ends from the production of phthalic anhydride from naphthalene.
K024..........	Distillation bottoms from the production of phthalic anhydride from naphthalene.
K025..........	Distillation bottoms from the production of nitrobenzene by the nitration of benzene.
K026..........	Stripping still tails from the production of methyl ethyl pyridines.
K027..........	Centrifuge and distillation residues from toluene diisocyanate production.
K028..........	Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.
K029..........	Waste from the product steam stripper in the production of 1,1,1-trichloroethane.
K030..........	Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.
K031..........	By-product salts generated in the production of MSMA and cacodylic acid.
K032..........	Wastewater treatment sludge from the production of chlordane.
K033..........	Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.
K034..........	Filter solids from the filtration of hexachlorocyclopenta-diene in the production of chlordane.
K035..........	Wastewater treatment sludges generated in the production of creosote.
K036..........	Still bottoms from toluene reclamation distillation in the production of disulfoton.
K037..........	Wastewater treatment sludges from the production of disulfoton.
K038..........	Wastewater from the washing and stripping of phorate production.
K039..........	Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.
K040..........	Wastewater treatment sludge from the production of phorate.
K041..........	Wastewater treatment sludge from the production of toxaphene.
K042..........	Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.
K043..........	2,6-Dichlorophenol waste from the production of 2,4-D.
K044..........	Wastewater treatment sludges from the manufacturing and processing of explosives.
K045..........	Spent carbon from the treatment of wastewater containing explosives.
K046..........	Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.
K047..........	Pink/red water from TNT operations.
K048..........	Dissolved air flotation (DAF) float from the petroleum refining industry.
K049..........	Slop oil emulsion solids from the petroleum refining industry.
K050..........	Heat exchanger bundle cleaning sludge from the petroleum refining industry.
K051..........	API separator sludge from the petroleum refining industry.
K052..........	Tank bottoms (leaded) from the petroleum refining industry.
K060..........	Ammonia still lime sludge from coking operations.
K061..........	Emission control dust/sludge from the primary production of steel in electric furnaces.
K062..........	Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry. (See codes 331 & 332).
K064..........	Acid plant blowdown slurry/sludge resulting from the thickening of blowdown

slurry from primary copper production.

K065.......... Surface impoundment solids contained in and dredged from surface impoundments at primary lead smelting facilities.

K066.......... Sludge from treatment of process wastewater and/or acid plant blowdown from primary zinc production.

K069.......... Emission control dust/sludge from secondary lead smelting.

K071.......... Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.

K073.......... Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.

K083.......... Distillation bottoms from aniline production.

K084.......... Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.

K085.......... Distillation or fractionation column bottoms from the production of chlorobenzenes.

K086.......... Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.

K087.......... Decanter tank tar sludge from coking operations.

K088.......... Spent potliners from primary aluminum reduction.

K090.......... Emission control dust or sludge from ferrochromiumsilicon production.

K091.......... Emission control dust or sludge from ferrochromium production.

K093.......... Distillation light ends from the production of phthalic anhydride from ortho-xylene.

K094.......... Distillation bottoms from the production of phthalic anhydride from ortho-xylene.

K095.......... Distillation bottoms from the production of 1,1,1-trichloroethane.

K096.......... Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.

K097.......... Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.

K098.......... Untreated process wastewater from the production of toxaphene.

K099.......... Untreated wastewater from the production of 2,4-D.

K100.......... Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.

K101.......... Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.

K102.......... Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.

K103.......... Process residues from aniline extraction from the production of aniline.

K104.......... Combined wastewater streams generated from nitrobenzene/aniline production.

K105.......... Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.

K106.......... Wastewater treatment sludge from the mercury cell process in chlorine production.

K107.......... Column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazines.

K108.......... Condensed column overheads from product separation and condensed reactor vent gases from the production of 1,1-dimethylhydrazind (UDMH) from carboxylic acid hydrazides.

K109.......... Spent filter cartridges from product purification from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.

K110.......... Condensed column overheads from intermediate separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.

K111.......... Product washwaters from the production of dinitrotoluene via nitration of toluene.

K112.......... Reaction by-product water from the s from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.

K113.......... Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.

K114.......... Vicinal from the purification of toluenediamine in the production of toluenediamine via hydrogenationof dinitrotoluene.

K115.......... Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.

K116.......... Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.

K117.......... Wastewater from the reactor vent gas scrubber in the production of ethylene dibromide via bromination of ethene.

K118.......... Spent adsorbent solids from purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.

K123.......... Process wastewater (including supernates, filtrates, and washwaters) from the production of ethylenebisdithio-carbamic acid and its salt.

K124.......... Reactor vent scrubber water from the production of ethylenebisdithiocarbamic acid and its salts.

K125.......... Filtration, evaporation, and centrifugation solids from the production of ethylenebisdithiocarbamic acid and its salts.

K126.......... Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylene-bisdithiocarbamic acid and its salts.

K131.......... Wastewater from the reactor and spent sulfuric acid from the acid dryer from the production of methyl bromide.

K132.......... Spent absorbent and wastewater separator solids from the production of methyl bromide.

K136.......... Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.

K141.......... Process residues from the recovery of coal tar, including, but not limited to, collecting sump residues from the production of coke from coal or from the recovery of coke by-products produced from coal. This listing does not include K087 (decanter tank tar sludges from coking operations).

K142.......... Tar storage tank residues from the production of coke from coal or from the recovery of coke by-products produced from coal.

K143.......... Process residues from the recovery of light oil, including, but not limited to, those generated in stills, decanters, and wash oil recovery units from the recovery of coke by-products produced from coal.

K144.......... Wastewater sump residues from light oil refining, including, but not limited to, intercepting or contamination sump sludges from the recovery of coke by-

products produced from coal.

K145.......... Residues from naphthalene collection and recovery operations from the recovery of coke by-products produced from coal.

K147.......... Tar storage tank residues from coal tar refining.

K148.......... Residues from coal tar distillation, including but not limited to, still bottoms.

K149.......... Distillation bottoms from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups, (This waste does not include still bottoms from the distillation of benzyl chloride).

K150.......... Organic residuals, excluding spent carbon adsorbent, from the spent chlorine gas and hydrochloric acid recovery processes associated with the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.

K151.......... Wastewater treatment sludges, excluding neutralization and biological sludges, generated during the treatment of wastewaters from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.

K156.......... Organic waste (including heavy ends, still bottoms, light ends, spent solvents, filtrates, and decantates) from the production of carbamates and carbamomyl oximes.

K157.......... Wastewaters (including scrubber waters, condenser waters, wash waters and separation waters) from the production of carbamates and carbamoyl oxides.

K158.......... Baghouse dusts and filter/separation solids from the production of thiocarbamates and solids from the produciton of carbamates and carbamoyl oxides.

K159.......... Organics from the treatment of thiocarbamate wastes.

K160.......... Solids (including filter wastes, separation solids, and spent catalysts) from the production of thiocarbamates and solids fromt he treatment of thiocarbamate wastes.

K161.......... Purification solids (including filtration, evaporation, and centrifugation solids), baghouse dust and floor sweepings from the production of dithiocarbamate acids and their salts. (This listing does not include K125 or K126.)

P001.......... 2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%

P001.......... Warfarin, & salts, when present at concentrations greater than 0.3%

P002.......... Acetamide, N-(aminothioxomethyl)-

P002.......... 1-Acetyl-2-thiourea

P003.......... Acrolein

P003.......... 2-Propenal

P004.......... Aldrin

P004.......... 1,4:5,8-Dimethanonaphthalene,1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a,-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-

P005.......... Allyl Alcohol

P005.......... 2-Propen-1-ol

P006.......... Aluminum phosphide

P007..........	5-(Aminomethyl)-3-isoxazolol
P007..........	3(2H)-Isoxazolone, 5-(aminomethyl)-
P008..........	4-alpha-Aminopyridine
P008..........	4-Pyridinamine
P009..........	Ammonium picrate
P009..........	Phenol, 2,4,6-trinitro-, ammonium salt
P010..........	Arsenic acid H_3AsO_4
P011..........	Arsenic oxide As_2O_5
P011..........	Arsenic pentoxide
P012..........	Arsenic oxide AS_2O_3
P013..........	Barium cyanide
P014..........	Benzenethiol
P014..........	Thiophenol
P015..........	Beryllium Dust
P016..........	Dichloromethyl ether
P016..........	Methane, oxybis[chloro-
P017..........	Bromoacetone
P017..........	2-Propanone, 1-bromo-
P018..........	Brucine
P018..........	Strychnidin-10-one, 2,3-dimethoxy-
P020..........	Dinoseb
P020..........	Phenol, 2-(1-methylpropyl)-4,6-dinitro-
P021..........	Calcium cyanide
P021..........	Calcium cyanide $Ca(CN)_2$
P022..........	Carbon disulfide
P023..........	Acetaldehyde, chloro-
P023..........	Chloroacetaldehyde
P024..........	Benzenamine, 4-chloro-
P024...........	p-Chloroaniline
P026..........	1-(o-Chlorophenyl)thiourea
P026..........	Thiourea, (2-chlorophenyl)-
P027..........	3-Chloropropionitrile
P027..........	Propanenitrile, 3-chloro
P028..........	Benzene, (chloromethyl)-
P028..........	Benzyl chloride
P029..........	Copper cyanide
P029..........	Copper cyanide Cu(CN)
P030..........	Cyanides (soluble cyanide salts), not otherwise specified
P031..........	Cyanogen
P031..........	Ethanedinitrile
P033..........	Cyanogen chloride
P033..........	Cyanogen chloride (CN)Cl
P034..........	2-Cyclohexyl-4,6-dinitrophenol
P034..........	Phenol, 2-cyclohexyl-4,6-dinitro
P036..........	Arsonous dichloride, phenyl-
P036..........	Dichlorophenylarsine

P037..........	Dieldrin
P037..........	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro,-(1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta,7aalpha)-
P038..........	Arsine, diethyl-
P038..........	Diethylarsine
P039..........	Disulfoton
P039..........	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester
P040..........	O,O-Diethyl O-pyrazinyl phosophorothioate
P040..........	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester
P041..........	Diethyl-p-nitrophenyl phosphate
P041..........	Phosphoric acid, diethyl 4-nitrophenyl ester
P042..........	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-,
P042..........	Epinephrine
P043..........	Diisopropylfluorophosphate (DFP)
P043..........	Phosphorofluoridic acid, bis(1-methylethyl) ester
P044..........	Dimethoate
P044..........	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
P045..........	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[(methylamino)carbonyl] oxime
P045..........	Thiofanox
P046..........	Benzeneethanamine, alpha,alpha-dimethyl-
P046..........	alpha,alpha-Dimethylphenethylamine
P047..........	4,6-Dinitro-o-cresol,& salts
P047..........	Phenol, 2-methyl-4,5-dinitro-, & salts
P048..........	2,4-Dinitrophenol
P048..........	Phenol, 2,4-dinitro-
P049..........	2,4-Dithiobiuret
P049..........	Thioimidodicarbonic diamide $[H_2N)C(S)]_2NH$
P050..........	Endosulfan
P050..........	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-,3-oxide
P051..........	Endrin
P051..........	Endrin, & metabolites
P051..........	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro,-(1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta,7aalpha)-& metabolites
P054..........	Aziridine
P054..........	Ethyleneimine
P056..........	Fluorine
P057..........	Acetamide, 2-fluoro
P057..........	Fluoroacetamide
P058..........	Acetic acid, fluoro-, sodium salt
P058..........	Fluoroacetic acid, sodium salt
P059..........	Heptachlor
P059..........	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-
P060..........	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa-chloro-1,4,4a,5,8,8a-

hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-

P060.......... Isodrin
P062.......... Hexaethyl tetraphosphate
P062.......... Tetraphosphoric acid, hexaethyl ester
P063.......... Hydrocyanic acid
P063.......... Hydrogen cyanide
P064.......... Methane, isocyanato-
P064.......... Methyl isocyanate
P065.......... Fulminic acid, mercury(2+) salt
P065.......... Mercury fuminate
P066.......... Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester
P066.......... Methomyl
P067.......... Aziridine, 2-methyl-
P067.......... 1,2-Propylenimine
P068.......... Hydrazine, methyl-
P068.......... Methyl hydrazine
P069.......... 2-Methyllactonitrile
P069.......... Propanenitrile, 2-hydroxy-2-methyl-
P070.......... Aldicarb
P070.......... Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime
P071.......... Methyl parathion
P071.......... Phosphorothioic acid, O,O,-dimethyl O-(4-nitrophenyl) ester
P072.......... alpha-Naphthylthiourea
P072.......... Thiourea, 1-naphthalenyl-
P073.......... Nickel carbonyl
P073.......... Nickel carbonyl $Ni(CO)_4$,(T-4)-
P074.......... Nickel cyanide
P074.......... Nickel cyanide $Ni(CN)_2$
P075.......... Nicotine, & salts
P075.......... Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts
P076.......... Nitric oxide
P076.......... Nitrogen oxide
P077.......... Benzenamine, 4-nitro
P077.......... p-Nitroaniline
P078.......... Nitrogen dioxide
P078.......... Nitrogen oxide NO_2
P081.......... Nitroglycerine
P081.......... 1,2,3-Propanetriol, trinitrate
P082.......... Methanamine, N-methyl-N-nitroso-
P082.......... N-Nitrosodimethylamine
P084.......... N-Nitrosomethylvinylamine
P084.......... Vinylamine, N-methyl-N-nitroso
P085.......... Diphosphoramide, octamethyl-
P085.......... Octamethylpyrophosphoramide
P087.......... Osmium oxide OsO_4, (T-4)-
P087.......... Osmium tetroxide

P088..........	Endothal
P088..........	7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
P089..........	Parathion
P089..........	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester
P092..........	Mercury, (acetato-O)phenyl-
P092..........	Phenylmercury acetate
P093..........	Phenylthiourea
P093..........	Thiourea, phenyl-
P094..........	Phorate
P094..........	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester
P095..........	Carbon dichloride
P095..........	Phosgene
P096..........	Hydrogen phosphide
P096..........	Phosphine
P097..........	Famphur
P097..........	Phosphorothioic acid, O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester
P098..........	Potassium cyanide
P098..........	Potassium cyanide K(CN)
P099..........	Argentate(1-), bis(cyano-C)-, potassium
P099..........	Potassium silver cyanide
P101..........	Ethyl cyanide
P101..........	Propanenitrile
P102..........	Propargyl alcohol
P102..........	2-Propyn-1-ol
P103..........	Selenourea
P104..........	Silver cyanide
P104..........	Silver cyanide Ag(CN)
P105..........	Sodium azide
P106..........	Sodium cyanide
P106..........	Sodium cyanide Na(CN)
P107..........	Strontium sulfide SrS
P108..........	Strychnidin-10-one, & salts
P108..........	Strychnine, & salts
P109..........	Tetraethyldithiopyrophosphate
P109..........	Thiodiphosphoric acid, tetraethyl ester
P110..........	Plumbane, tetraethyl-
P110..........	Tetraethyl lead
P111..........	Diphosphoric acid,tetraethyl ester
P111..........	Tetraethyl pyrophosphate
P112..........	Methane, tetranitro-
P112..........	Tetranitromethane
P113..........	Thallic oxide
P113..........	Thallium oxide Tl_2O_3
P114..........	Selenious acid, dithallium (1+) salt
P114..........	Thallium(I) selenite
P115..........	Sulfuric acid, dithallium(1+) salt

P115.......... Thallium(l) sulfate
P116.......... Hydrazinecarbothioamide
P116.......... Thiosemicarbazide
P118.......... Methanethiol, trichloro-
P118.......... Trichloromethanethiol
P119.......... Ammonium vanadate
P119.......... Vanadic acid, ammonium salt
P120.......... Vanadium oxide V_2O_5
P120.......... Vanadium pentoxide
P121.......... Zinc cyanide
P121.......... Zinc cyanide $Zn(CN)_2$
P122.......... Zinc phosphide Zn_3P_2, when present at concentrations greater than 10% (R,T)
P123.......... Toxaphene
P127.......... Carbofuran
P127.......... 7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate
P128.......... Mexacarbamate
P128.......... Phenol, 4--(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester)
P185.......... Tirpate
P185.......... 1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-,o-[(methylamino)-carbonyl] oxime
P188.......... Physostigmine salicylate
P188.......... Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a, 8, 8a-hexahydro-1,3a,8-trimethylpyrrolo[2,3-b]indol -5-yl methylcarbamate ester (1:1)
P189.......... Carbosulfan
P189.......... Carbamic acid, [(dibutylamino)-thio}methyl-, 2,3-dihydro-2,2 dimethyl-7-benzofuranyl ester
P190.......... Metolcarb
P190.......... Carbamic acid, methyl-, 3-methylphenyl ester
P191.......... Dimetilan
P191.......... Carbamic acid, dimethyl-, 1-[(dimethyl-amino) carbonyl]-5-methyl-1H-pyrazol-3-yl ester
P192.......... Isolan
P192.......... Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester
P194.......... Oxamyl
P194.......... Ethanimidothioc acid, 2-(dimethylamino)-N-[[(methylamino) carbonyl]oxy]-2-oxo-, methyl ester
P196.......... Manganese dimethyldithiocarbamate
P196.......... Manganese, bis (dimethylcarbamodithioato-S,S')-
P197.......... Formparanate
P197.......... Methanimidamide, N,N-dimethyl-N'-[2-methyl-4-[[(methyl-amino) carbonyl] o xy]phenyl]-
P198.......... Formetanate hydrochloride
P198.......... Methanimidamide, N,N-dimethyl-N'-[3-[[(methylamino)-carbonyl]oxy] phenyl]-, monohydrochloride
P199.......... Methiocarb
P199.......... Phenol, (3,5-dimethyl-4-(methylthio)-,methylcarbamate

P201.......... Promecarb
P201.......... Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate
P202.......... m-Cumenyl methylcarbamate
P202.......... 3-Isopropylphenyl N-methylcarbamate
P203.......... Aldicarb sulfone
P203.......... Propanal, 2-methyl-2-(methyl-sulfonyl)-, ...o-[(methylamino)carbonyl] oxime
P204.......... Physostigmine
P204.......... Pyrrolo[2,3-b]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3aS-cis)-
P205.......... Ziram
P205.......... Zinc, bis (dimethylcarbamodithioato-S,S')-

U001.......... Acetaldehyde
U001.......... Ethanal
U002.......... Acetone
U002.......... 2-Propanone
U003.......... Acetonitrile
U004.......... Acetophenone
U004.......... Ethanone, 1-phenyl-
U005.......... Acetamide, N-9H-fluoren-2-yl-
U005.......... 2-Acetylaminofluorene
U006.......... Acetyl chloride
U007.......... Acrylamide
U007.......... 2-Propenamide
U008.......... Acrylic acid
U008.......... 2-Propenoic acid
U009.......... Acrylonitrile
U009.......... 2-Propenenitrile
U010.......... Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta,8aalpha,9balpha)]-
U010.......... Mitomycin C
U011.......... Amitrole
U011.......... 1H-1,2,4-Triazol-3-amine
U012.......... Aniline
U012.......... Benzenamine
U014.......... Auramine
U014.......... Benzenamine,4,4'-carbonimidoylbis[N,N-dimethyl-
U015.......... Azaserine
U015.......... L-Serine, diazoacetate (ester)
U016.......... Benz[c]acridine
U016.......... 3,4-Benzacridine
U017.......... Benzal chloride
U017.......... Benzene, (dichloromethyl)-
U018.......... Benz[a]anthracene
U019.......... Benzene

U020..........	Benzenesulfonic acid chloride
U020..........	Benzenesulfonyl chloride
U021..........	Benzidine
U021..........	[1,1'-Biphenyl]-4,4'-diamine
U022..........	Benzo[a]pyrene
U023..........	Benzene, (trichloromethyl)-
U023..........	Benzotrichloride
U024..........	Dichloromethoxy ethane
U024..........	Ethane,1,1'-[methylenebis(oxy)]bis[2-chloro-
U025..........	Dichloroethyl ether
U025..........	Ethane, 1,1'-oxybis[2-chloro-
U026..........	Chlornaphazine
U026..........	Naphthylenamine, N,N'-bis(2-chloromethyl)-
U027..........	Dichloroisopropyl ether
U027..........	Propane, 2,2-oxybis[2-chloro-
U028..........	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U028..........	Diethylhexyl phthalate
U029..........	Methane, bromo-
U029..........	Methyl bromide
U030..........	Benzene, 1-bromo-4-phenoxy-
U030..........	4-Bromophenyl phenyl ether
U031..........	1-Butanol
U031..........	n-Butyl alcohol
U032..........	Calcium chromate
U032..........	Chromic acid (H_2CrO_4)
U033..........	Carbonic difluoride
U033..........	Carbon oxyfluoride
U034..........	Acetaldehyde, trichloro-
U034..........	Chloral
U035..........	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
U035..........	Chlorambucil
U036..........	Chlordane, alpha & gamma isomers
U036..........	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U037..........	Benzene, chloro-
U037..........	Chlorobenzene
U038..........	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester
U038..........	Chlorobenzilate
U039..........	p-Chloro-m-cresol
U039..........	Phenol,4-chloro-3-methyl-
U041..........	Epichlorohydrin
U041..........	Oxirane, (chloromethyl)-
U042..........	2-Chloroethyl vinyl ether
U042..........	Ethene, (2-chloroethoxy)-
U043..........	Ethene, chloro-
U043..........	Vinyl chloride
U044..........	Chloroform

U044.......... Methane, trichloro-
U045.......... Methane,chloro-
U045.......... Methyl chloride
U046.......... Chloromethyl methyl ether
U046.......... Methane, chloromethoxy-
U047.......... beta-Chloronaphthalene
U047.......... Naphthalene, 2-chloro-
U048.......... o-Chlorophenol
U048.......... Phenol, 2-chloro
U049.......... Benzenamine, 4-chloro-2-methyl-, hydrochloride
U049.......... 4-Chloro-o-toluidine, hydrochloride
U050.......... Chrysene
U051.......... Creosote
U052.......... Cresol (Cresylic acid)
U052.......... Phenol, methyl-
U053.......... 2-Butenal
U053.......... Crotonaldehyde
U055.......... Benzene, (1-methylethyl)-
U055.......... Cumene
U056.......... Benzene, hexahydro-
U056.......... Cyclohexane
U057.......... Cyclohexanone
U058.......... Cyclophosphamide
U058.......... 2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U059.......... Daunomycin
U059.......... 5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11,-trihydroxy-1-methoxy-, (8S-cis)-
U060.......... Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-
U060.......... DDD
U061.......... Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-
U061.......... DDT
U062.......... Carbamothioic acid, bis(1-methylethyl)-S-(2,3-dichloro-2-propenyl) ester
U062.......... Diallate
U063.......... Dibenz[a,h]anthracene
U064.......... Benzo[rst]pentaphene
U064.......... Dibenzo[a,i]pyrene
U066.......... 1,2-Dibromo-3-chloropropane
U066.......... Propane,1,2-dibromo-3-chloro-
U067.......... Ethane,1,2-dibromo-
U067.......... Ethylene dibromide
U068.......... Methane, dibromo-
U069.......... 1,2-Benzenedicarboxylic acid, dibutyl ester
U069.......... Dibutyl phthalate
U070.......... Benzene, 1,2-dichloro-
U070.......... o-Dichlorobenzene
U071.......... Benzene, 1,3-dichloro-

U071..........	m-Dichlorobenzene
U072..........	Benzene, 1,4-dichloro-
U072..........	p-Dichlorobenzene
U073..........	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U073..........	3,3'-Dichlorobenzidine
U074..........	2-Butene, 1,4-dichloro-
U074..........	1,4-Dichloro-2-butene
U075..........	Dichlorodifluoromethane
U075..........	Methane, dichlorodifluoro-
U076..........	Ethane,1,1-dichloro-
U076..........	Ethylidene dichloride
U077..........	Ethane, 1,2-dichloro-
U077..........	Ethylene dichloride
U078..........	1,1-Dichloroethylene
U078..........	Ethene, 1,1-dichloro-
U079..........	1,2-Dichloroethylene
U079..........	Ethene, 1,2-dichloro-
U080..........	Methane, dichloro-
U080..........	Methylene chloride
U081..........	2,4-Dichlorophenol
U081..........	Phenol, 2,4-dichloro-
U082..........	2,6-Dichlorophenol
U082..........	Phenol,2,6-dichloro-
U083..........	Propane, 1,2-dichloro-
U083..........	Propylene dichloride
U084..........	1,3-Dichloropropene
U084..........	1-Propene, 1,3-dichloro-
U085..........	2,2'-Bioxirane
U085..........	1,2,3,4-Diepoxybutane
U086..........	N,N'-Diethylhydrazine
U086..........	Hydrazine, 1,2-diethyl-
U087..........	O,O-DiethylS-methyl dithiophosphate
U087..........	Phosphorodithioic acid, O,O-diethyl S-methyl ester
U088..........	1,2-Benzenedicarboxylic acid, diethyl ester
U088..........	Diethyl phthalate
U089..........	Diethylstilbestrol
U089..........	Phenol,4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-
U090..........	1,3-Benzodioxole, 5-propyl-
U090..........	Dihydrosafrole
U091..........	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U091..........	3,3'-Dimethoxylbenzidine
U092..........	Dimethylamine
U092..........	Methanamine, N-methyl-
U093..........	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U093..........	p-Dimethylaminoazobenzene
U094..........	Benz[a]anthracene, 7,12-dimethyl-

U094..........	7,12-Dimethylbenz[a]anthracene
U095..........	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U095..........	3,3'-Dimethylbenzidine
U096..........	alpha,alpha-Dimethylbenzylhydroperoxide
U096..........	Hydroperoxide, 1-methyl-1-phenylethyl-
U097..........	Carbamic chloride, dimethyl-
U097..........	Dimethylcarbamoyl chloride
U098..........	1,1-Dimethylhydrazine
U098..........	Hydrazine, 1,1-dimethyl-
U099..........	1,2-Dimethylhydrazine
U099..........	Hydrazine, 1,2-dimethyl-
U101..........	2,4-Dimethylphenol
U101..........	Phenol, 2,4-dimethyl-
U102..........	1,2-Benzenedicarboxylic acid, dimethyl ester
U102..........	Dimethyl phthalate
U103..........	Dimethyl sulfate
U103..........	Sulfuric acid, dimethyl ester
U105..........	Benzene, 1-methyl-2,4-dinitro
U105..........	2,4-Dinitrotoluene
U106..........	Benzene, 2-methyl-1,3-dinitro
U106..........	2,6-Dinitrotoluene
U107..........	1,2-Benzenedicarboxylic acid, di-n-octyl ester
U107..........	Di-n-octyl-phthalate
U108..........	1,4-Diethyleneoxide
U108..........	1,4-Dioxane
U109..........	1,2-Diphenylhydrazine
U109..........	Hydrazine, 1,2-diphenyl-
U110..........	Dipropylamine
U110..........	1-Propanamine,N-propyl-
U111..........	Di-n-propylnitrosamine
U111..........	1-Propanamine,N-nitroso-N-propyl-
U112..........	Acetic acid ethyl ester
U112..........	Ethyl acetate
U113..........	Ethyl acrylate
U113..........	2-Propenoic acid, ethyl ester
U114..........	Carbamodithioic acid, 1,2-etanediylbis-, salts & esters
U114..........	Ethylenebisdithiocarbamic acid, salts & esters
U115..........	Ethylene oxide
U115..........	Oxirane
U116..........	Ethylenethiourea
U116..........	2-Imidazolidinethione
U117..........	Ethane, 1,1'-oxybis-
U117..........	Ethyl ether
U118..........	Ethyl methacrylate
U118..........	2-Propenoic acid,2-methyl-,ethyl ester
U119..........	Ethyl methanesulfonate

U119..........	Methanesulfonic acid, ethyl ester
U120..........	Fluroanthene
U121..........	Methane, trichlorofluoro-
U121..........	Trichloromonofluoromethane
U122..........	Formaldehyde
U123..........	Formic acid
U124..........	Furan
U124..........	Furfuran
U125..........	2-Furancarboxaldehyde
U125..........	Furfural
U126..........	Glycidylaldehyde
U126..........	Oxiranecarboxylaldehyde
U127..........	Benzene, hexachloro-
U127..........	Hexachlorobenzene
U128..........	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U128..........	Hexachlorobutadiene
U129..........	Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha,3beta,4alpha,5alpha,6beta)
U129..........	Lindane
U130..........	1,3-Cyclopentadiene,1,2,3,4,5,5-hexachloro-
U130..........	Hexachlorocyclopentadiene
U131..........	Ethane, hexachloro-
U131..........	Hexachloroethane
U132..........	Hexachlorophene
U132..........	Phenol,2,2-methylenebis[3,4,6-trichloro-
U133..........	Hydrazine
U134..........	Hydrofluoric acid
U134..........	Hydrogen fluoride
U135..........	Hydrogen sulfide
U135..........	Hydrogen sulfide H_2S
U136..........	Arsinic acid, dimethyl-
U136..........	Cacodylic acid
U137..........	Indeno[1,2,3-cd]pyrene
U138..........	Methane, iodo
U138..........	Methyl iodide
U140..........	Isobutyl alcohol
U140..........	1-Propanol, 2-methyl-
U141..........	1,3-Benzodioxole, 5-(1-propenyl)-
U141..........	Isosafrole
U142..........	Kepone
U142..........	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5a,5b,6-decachlorooctahydro-
U143..........	2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*), 7aalpha]]-
U143..........	Lasiocarpine
U144..........	Acetic acid, lead(2+) salt

U144..........	Lead acetate
U145..........	Lead phosphate
U145..........	Phosphoric acid,lead(2+) salt (2:3)
U146..........	Lead, bis(aceto-O)tetrahydroxytri-
U146..........	Lead subacetate
U147..........	2,5-Furandione
U147..........	Maleic anhydride
U148..........	Maleic hydrazide
U148..........	3,6-Pyridazinedione,1,2-dihydro-
U149..........	Malononitrile
U149..........	Propanedinitrile
U150..........	Melphalan
U150..........	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-
U151..........	Mercury
U152..........	Methacrylonitrile
U152..........	2-Propenenitrile,2-methyl-
U153..........	Methanethiol
U153..........	Thiomethanol
U154..........	Methanol
U154..........	Methyl alcohol
U155..........	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-
U155..........	Methapyrilene
U156..........	Carbonochloridic acid, methyl ester
U156..........	Methyl chlorocarbonate
U157..........	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U157..........	3-Methylcholanthrene
U158..........	Benzenamine, 4,4'-methylenebis[2-chloro-
U158..........	4,4'-Methylenebis(2-chloroaniline)
U159..........	2-Butanone
U159..........	Methyl ethyl ketone (MEK)
U160..........	2-Butanone, peroxide
U160..........	Methyl ethyl ketone peroxide
U161..........	Methyl isobutyl ketone
U161..........	4-Methyl-2-pentanone
U161..........	Pentanol, 4-methyl-
U162..........	Methyl methacrylate
U162..........	2-Propenoic acid, 2-methyl-, methyl ester
U163..........	Guanidine,N-methyl-N'-nitro-N-nitroso
U163..........	MNNG
U164..........	Methylthiouracil
U164..........	4(1H)-Pyrimidinone,2,3-dihydro-6-methyl-2-thioxo-
U165..........	Naphthalene
U166..........	1,4-Naphthalene, 2-chloro
U166..........	1,4-Naphthoquinone
U167..........	1-Naphthalenamine
U167..........	alpha-Naphthylamine

U168..........	2-Naphthalenamine
U168..........	beta-Naphthylamine
U169..........	Benzene, nitro-
U169..........	Nitrobenzene
U170..........	p-Nitrophenol
U170..........	Phenol, 4-nitro-
U171..........	2-Nitropropane
U171..........	Propane,2-nitro-
U172..........	1-Butanamine, N-butyl-N-nitroso-
U172..........	N-Nitrosodi-n-butylamine
U173..........	Ethanol, 2,2'-(nitrosoimino)bis-
U173..........	N-Nitrosodiethanolamine
U174..........	Ethanamine,N-ethyl-N-nitroso-
U174..........	N-Nitrosodiethylamine
U176..........	N-Nitroso-N-ethylurea
U176..........	Urea, N-ethyl-N-nitroso-
U177..........	N-Nitroso-N-methylurea
U177..........	Urea, N-methyl-N-nitroso-
U178..........	Carbamic acid, methylnitroso-, ethyl ester
U178..........	N-Nitroso-N-methylurethane
U179..........	N-Nitrosopiperidine
U179..........	Piperidine,1-nitroso-
U180.........:	N-Nitrosopyrrolidine
U180..........	Pyrrolidine, 1-nitroso-
U181..........	Benzenamine, 2-methyl-5-nitro
U181..........	5-Nitro-o-toluidine
U182..........	Paraldehyde
U182..........	1,3,5-Trioxane,2,4,6-trimethyl-
U183..........	Benzene, pentachloro-
U183..........	Pentachlorobenzene
U184..........	Ethane, pentachloro-
U184..........	Pentachloroethane
U185..........	Benzene, pentachloronitro-
U185..........	Pentachloronitrobenzene (PCNB)
U186..........	1-Methylbutadiene
U186..........	1,3-Pentadiene
U187..........	Acetamide, N-(4-ethoxyphenyl)-
U187..........	Phenacetin
U188..........	Phenol
U189..........	Phosphorus sulfide
U189..........	Sulfur phosphide
U190..........	1,3-Isobenzofurandione
U190..........	Phthalic anhydride
U191..........	2-Picoline
U191..........	Pyridine, 2-methyl-
U192..........	Benzamide, 3,5-dichloro-N-(1,1-diethyl-2-propynyl)-

U192.......... Pronamide
U193.......... 1,2-Oxathiolane,2,2-dioxide
U193.......... 1,3-Propane sultone
U194.......... 1-Propanamine (I,T)
U194.......... n-Propylamine (I,T)
U196.......... Pyridine
U197.......... p-Benzoquinone
U197.......... 2,5-Cyclohexadiene,-1,4-dione
U200.......... Reserpine
U200.......... Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]-, methyl ester, (3beta,16beta,17alpha,18beta,20alpha)-
U201.......... 1,3-Benzenediol
U201.......... Resorcinol
U202.......... 1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts
U202.......... Saccharin,& salts
U203.......... 1,3-Benzodioxole, 4-(2-propenyl)-
U203.......... Safrole
U204.......... Selenious acid
U204.......... Selenium dioxide
U205.......... Selenium sulfide
U205.......... Selenium sulfide SeS_2 (R,T)
U206.......... Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-
U206.......... D-Glucose,2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]
U206.......... Streptozotocin
U207.......... Benzene, 1,2,4,5-tetrachloro-
U207.......... 1,2,4,5-Tetrachlorobenzene
U208.......... Ethane, 1,1,1,2-tetrachloro-
U208.......... 1,1,1,2-Tetrachloroethane
U209.......... Ethane, 1,1,2,2-tetrachloro
U209.......... 1,1,2,2,-Tetrachloroethane
U210.......... Ethene, tetrachloro-
U210.......... Tetrachloroethylene
U211.......... Methane, tetrachloro-
U213.......... Furan,tetrahydro-
U213.......... Tetrahydrofuran
U214.......... Acetic acid, thallium(1+) salt
U214.......... Thallium(I) acetate
U215.......... Carbonic acid, dithallium(1+) salt
U215.......... Carbon tetrachloride
U215.......... Thallium(I) carbonate
U216.......... Thallium(I) chloride
U216.......... Thallium chloride TICl
U217.......... Nitric acid, thallium(1+) salt
U218.......... Ethanethioamide
U218.......... Thioacetamide
U219.......... Thiourea

U220..........	Benzene, methyl-
U220..........	Toluene
U221..........	Benzenediamine, ar-methyl-
U221..........	Toluenediamine
U222..........	Benzenamine, 2-methyl-, hydrochloride
U222..........	o-Toluidine hydrochloride
U223..........	Benzene, 1,3-diisocyanatomethyl-
U223..........	Toluene diisocyanate
U225..........	Bromoform
U225..........	Methane, tribromo-
U226..........	Ethane, 1,1,1-trichloro-
U226..........	Methyl chloroform
U227..........	Ethane, 1,1,2-trichloro-
U227..........	1,1,2-Trichloroethane
U228..........	Ethene, trichloro-
U228..........	Trichloroethylene
U234..........	Benzene, 1,3,5-trinitro-
U234..........	1,3,5-Trinitrobenzene
U235..........	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U235..........	Tris(2,3-dibromopropyl) phosphate
U236..........	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt
U236..........	Trypan blue
U237..........	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-
U237..........	Uracil mustard
U238..........	Carbamic acid, ethyl ester
U238..........	Ethyl carbamate (urethane)
U239..........	Benzene, dimethyl-
U239..........	Xylene
U240..........	Acetic acid, (2.4-dichlorophenoxy)-, salts & esters
U240..........	2,4-D, salts & esters
U243..........	Hexachloropropene
U243..........	1-Propene, 1,1,2,3,3,3-hexachloro-
U244..........	Thioperoxydicarbonic diamide $[(H_2N)C(S)]_2S_2$, tetramethyl-
U244..........	Thiuram
U246..........	Cyanogen bromide (CN)Br
U247..........	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-methoxy-
U247..........	Methoxychlor
U248..........	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations of 0.3% or less
U248..........	Warfarin, & salts, when present at concentrations of 0.3% or less
U249..........	Zinc phosphide Zn_3P_2, when present at concentrations of 10% or less
U271..........	*Benomyl*
U271..........	*Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-, methyl ester*
U277..........	*Sulfallate*
U277..........	*Carbamodithioic acid, diethyl-, 2-chloro-2-propenyl ester*

U278.......... *Bendiocarb*
U278.......... *1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate*
U279.......... *Carbaryl*
U279.......... *1-Naphthalenol, methylcarbamate*
U280.......... *Barban*
U280.......... *Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester*
U328.......... Benzenamine, 2-methyl-
U328.......... o-Toluidine
U353.......... Benzenamine, 4-methyl-
U353.......... p-Toluidine
U359.......... Ethanol, 2-ethoxy-
U359.......... Ethylene glycol monoethyl ether
U364.......... *Bendiocarb phenol*
U364.......... *1,3-Benzodioxol-4-ol, 2,2-dimethyl-*
U365......... *Molinate*
U365.......... *H-Azepine-1-carbothioic acid, hexahydro-, S-ethyl ester*
U366.......... *Dazomet*
U366.......... *2H-1,3,5-Thiadiazine-2-thione, tetrahydro-3,5-dimethyl-*
U367.......... *Carbofuran phenol*
U367.......... *7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-*
U372.......... *Carbamic acid, 1H-benzimidazol-2-yl, methyl ester*
U372.......... *Carbendazim*
U373.........: *Carbamic acid, phenyl-, 1-methylethyl ester*
U373.......... *Propham*
U375.......... *Carbamic acid, butyl-, 3-iodo-2-propynyl ester*
U375.......... *3-Iodo-2-propynyl n-butylcarbamate*
U376.......... *Carbamodithioic acid, dimethyl-, tetraanhydrosulfide with orthothioselenious acid*
U376.......... *Selenium, tetrakis (dimethyldithiocarbamate)*
U377.......... *Carbamodithioic acid, methyl, -monopotassium salt*
U377.......... *Potassium n-methyldithiocarbamate*
U378.......... *Carbamodithioic acid, (hydroxymethyl) methyl-, monopotassium salt*
U378.......... *Potassium n-hydroxymethyl-n-methyldi-thiocarbamate*
U379.......... *Carbamodithioic acid, dibutyl, sodium salt*
U379.......... *Sodium dibutyldithiocarbamate*
U381.......... *Carbamodithioic acid, diethyl-, sodium salt*
U381.......... *Sodium diethyldithiocarbamate*
U382.......... *Carbamodithioic acid, dimethyl-, sodium salt*
U382.......... *Sodium dimethyldithiocarbamate*
U383.......... *Carbamodithioic acid, dimethyl, potassium salt*
U383.......... *Potassium dimethyldithiocarbamate*
U384.......... *Carbamodithioic acid, methyl-, monosodium salt*
U384.......... *Metam Sodium*
U385.......... *Carbamothioic acid, dipropyl-, S-propyl ester*
U385.......... *Vernolate*
U386.......... *Cycloate*

U386.......... *Carbamothioic acid, cyclohexylethyl-, S-ethyl ester*
U387.......... *Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester*
U387.......... *Prosulfocarb*
U389.......... *Carbamothioic acid, bis (1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester*
U389.......... *Triallate*
U390.......... *EPTC*
U390.......... *Carbamothioic acid, dipropyl-, S-ethyl ester*
U391.......... *Carbamothioic acid, butylethyl-, S-propyl ester*
U391.......... *Pebulate*
U392.......... *Butylate*
U392.......... *Carbamothioic acid, bis (2-methylpropyl)-, S-ethyl ester*
U393.......... *Copper dimethyldithiocarbamate*
U393.......... *Copper, bis (dimethylcarbamodithioato-S,S')-*
U394.......... *A2213*
U394.......... *Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester*
U395.......... *Diethylene glycol, dicarbamate*
U395.......... *Ethanol, 2,2'-oxybis-, dicarbamate*
U396.......... *Ferbam*
U396.......... *Iron, tris (dimethylcarbamodithioato-S,S')-,*
U400.......... *Bis (pentamethylene)thiuram tetrasulfide*

U400.......... *Piperidine, 1,1'-(tetrathiodicarbonothioyl)-bis-*
U401.......... *Bis (dimethylthiocarbamoyl) sulfide*
U401.......... *Tetramethylthiuram monosulfide*
U402.......... *Tetrabutylthiuram disulfide*
U402.......... *Thioperxydicarbonic diamide, tetrabutyl*
U403.......... *Disulfiram*
U403.......... *Thioperoxydicarbonic diamide, tetraethyl*
U404.......... *Ethanamine, N,N-diethyl*
U404.......... *Triethylamine*
U407.......... *Ethyl Ziram*
U407.......... *Zinc, bis(diethylcarbamodithioato-S,S')-*
U409.......... *Carbamic acid, [1,2-phenylenebis(iminocarbonothioyl)]bis-, dimethyl ester*
U409.......... *Thiophanate-methyl*
U410.......... *Ethanimidothioic acid, N,N'-[thi-obis[(methylimino)carbonyloxy]]bis-, dimethyl ester*
U410.......... *Thiodicarb*
U411.......... *Phenol, 2-(1-methylethoxy)-, methylcarbamate*
U411.......... *Propoxur*

Process Information/
Storage
Section D

D. PROCESS INFORMATION/STORAGE

Storage of spent carbon characterized as hazardous or residual waste is permitted in approved storage tanks and small containers as specified below. This information is presented as Section D-1 to remain consistent with the suggested format.

D-1 Tanks

D-1.1 Description of Tanks

The spent granular carbon received as hazardous or residual waste at Calgon Carbon Corporation's Neville Island facility may be stored in one of four tanks. These tanks are identified on the accompanying Piping and Instrument Diagram (Exhibit D-1) and Area Plan (Exhibit D-2) as Spent Carbon (storage) Tanks and labeled T-401, T-402, T-403, and T-404.

The Spent Carbon Tanks, more fully described below in Item 2, are FRP tanks designed to operate at atmospheric pressure. Tanks T-402 and T-404 each have a capacity of 30,000 gallons, and Tanks T-401 and T-403 have a capacity of 20,565 gallons each. The tanks are to temporarily store the spent carbon prior to the regeneration process. In case of regeneration process shutdowns, outages, or possible "campaign" usage, the storage tanks may be required to store the spent carbon (hazardous and residual) for extended periods (as long as 3 to 6 months). In normal operation, the entire storage facility capacity of spent carbon (418,000 pounds total to include small containers, 360,000 pounds for tank storage alone) provides a 4 to 5 day supply for the regeneration facility. The storage facility is managed to minimize the retention time of spent carbon in the storage tanks.

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Hazardous and residual spent carbon is received at the facility in enclosed trailers or small containers and transferred to the storage tank as fully described in Section F-4. Procedures utilized to prevent tank overfilling are described below in Item 4. The spent carbon is transferred out of the storage tank via pump to the regeneration unit as described in section F-4.

D-1.2 Design of Tanks

Tanks T-402 and T-404 are designed to contain 100,000 pounds each of spent granular carbon. Tanks T-401 and T-403 have a design capacity of 80,000 pounds each. At a density of 28 pounds of carbon per cubic foot, a tank containing 3,570 cubic feet or 26,700 gallons was required. A tank capacity of 30,000 gallons was selected to provide a safety factor and allow selection of a standard tank unit; 12' dia. by 36' straight side. The specific gravity of the carbon-water slurry utilized in the design of the tank is 1.15. Tanks T-401 and T-403 have a smaller design capacity due to the cone-bottomed design. The individual capacities are 20,565 gallons each.

The tank dimensions are provided in detail in Exhibit D-3, which provides the vendor drawings for Tanks T-401 to T-404. The tank drawings are sealed by a registered Professional Engineer. As shown on the drawings for tanks T-402 and T-404, the tanks are 12' dia. by 36' straight side in order to contain 100,000 pounds of spent carbon. The tanks have flat bottoms for support and a dished head. The wall width varies with the height of the vessel according to the manufacturer's practice. The wall width calculations are provided in Justin's General Construction Specification No. 106, included in the tank specification package, Exhibit D-5.

D. PROCESS INFORMATION/STORAGE

Tanks T-401 and T-403 were installed as ASTM-3299 type units having a 12' dia. by 22' straight side. The cone bottom increased the length of the tank by 9'7". Each tank has a capacity of 20,565 gallons which translates to 80,000 pounds of carbon. The top of the tank thickness is 0.25". The complete specification plan for these tanks is found in Exhibit D-5.

The spent carbon storage tanks and transfer lines are all heat traced and insulated to prevent possible freezing and breakage.

The tanks are equipped with 6" dia. open vents to prevent any accidental pressurization due to overfilling or thermal expansion, or depressurization due to emptying. Each of the vents has been tied into a VOC control system using an induced draft fan and granular carbon adsorbers (Ventsorbs).

The discharge nozzles are equipped with 4" stainless steel sleeves to prevent erosion of the outlet nozzles due to carbon slurry movement. The discharge piping also has water connections to backflush the area around the discharge in case of carbon bridging or blocking the discharge flow.

D-1.3 Tank Corrosion and Erosion

The spent granular carbon may be corrosive due to the nature of adsorbed contaminants. The carbon may contain a variety of organics, especially aromatic compounds, which have been removed by the carbon from wastewater or process streams. Because the carbon has adsorbed these species they will exhibit only minor corrosive properties. Also because of

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the service, the carbon-water slurry in storage may exhibit slight acid or alkaline characteristics.

Because of this wide-range of contaminants, corrosion grade polyester resins were chosen for tank construction. Such resins have exhibited good corrosion resistance in this service. The wall laminate was constructed with a corrosion grade reinforced Isopthalic Resin in ISO polyester; DION ISO 6631, a structural laminate manufactured by Ashland Chemical Company. The inner wall was coated with Atlac 382, a polyester resin manufactured by Reichhold, and glass reinforced. This combination provides good corrosion resistance to a wide range of organics, acids, and alkalies with good erosion resistance to the movement of granular carbon. This material selection has proven to be effective as there has been no visible deterioration in the vessel integrity during the service life of the vessel.

The transfer piping and valves in the tank farm facility are of stainless steel construction to provide erosion resistance to the movement of granular carbon while exhibiting good corrosion resistance. The transfer pump is a rubber-lined centrifugal pump designed for slurry service.

D-1.4 Tank Foundation Design

The design of the tank foundation is shown on the accompanying drawing in Exhibit D-5. The tank installation was made in accordance with the manufacturers recommendation, utilizing the tank hold down lugs as specified in Exhibit D-4.

The soils investigation for the tank farm area was performed by Engineering Mechanics,

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Inc. and is presented in their report entitled "Foundation Investigation, Carbon Reactivation Facilities, Calgon Carbon Corp., Neville Island Plant, Allegheny County, Pennsylvania. EMI Project 72163." This report is provided as Exhibit D-6.

D-1.5 Tank Management Practices

The operations involved at the tank farm, i.e. unloading and loading, are more fully explained in Section F-4.

A monitoring procedure is in place to prevent overfilling. The daily monitoring of the storage facility is shown in Section F-2 - Inspection Procedures. The delivery of spent carbon is in quantities of 20,000 pounds or less as reviewed in Section F-4. The tank farm yard person, knowing the available storage capacities in each of the tanks, is able to direct the shipment of spent carbon into the proper storage tank to prevent overfilling.

The discharge of the spent carbon is accomplished by the yard person connecting the proper storage tank to the transfer pump. The operator at the regeneration unit will inform the yard person when the feed tank is full and the transfer is stopped (after lines are cleared of residual spent carbon).

Water flush connections are provided for both fill and discharge lines to assist operations by clearing lines of residual carbon at the end of transfer operation or providing fluidization or motive water to transfer lines that may be temporarily blocked.

As reviewed in Section F-4, the tank farm is located within a containment area which will

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collect any spilled carbon or contaminated water.

The contaminated or "dirty" water system is used to provide a source of already contaminated water for addition to spent carbon. This water either makes a slurry of the carbon in the case of pump transfers or provides both motive force and further slurry dilution in the case of eductor transfer. During the course of operations, excess contaminated water is generated at the Hazardous and Residual Waste Management (HRWM) facility. This water is temporarily "stored" on site as excess dirty water in the operational unit (dirty water storage tank). Excess dirty water is periodically drawn from this tank as is disposed of in accordance with RCRA regulations.

D-2 Storage and Management of Containers

D-2.1 Container Types

The following types of containers will be stored at the Neville Island plant container storage site. The exact number of each type of container in storage at any given time cannot be estimated since this depends on the business activity for products in containers. Containers holding carbon characterized as hazardous will not be held in storage in excess of 90 days. The maximum amount of material in storage is expected to be 58,000 pounds (carbon basis).

a. Cyclesorb
b. Vapor-Pac (Stainless steel or polyethylene vessel)
c. Bulk Back bins (Steel or plastic tank)

D. PROCESS INFORMATION/STORAGE

d. Ventsorbs

e. Flexible Intermediate Bulk Container (IBC)

f. Agrisorbs

g. Drums

Containers may also be received from manufacturers other than Calgon Carbon Corporation. These containers are of comparable size and material to that of the Calgon Carbon containers.

D-2.2 Container Specifications

Complete specifications for Calgon Carbon Supplied containers are in the attached Table 2-1. The container specifications for containers other than those supplied by Calgon Carbon are found in Exhibit D-6. All containers meet applicable DOT standards and are compatible with materials handled.

D-2.3 Container Storage Area

The container storage area is approximately 1,300 square feet and shown in the attached drawing 3-1 and 3-2. This area is within the limits of the existing RCRA- permitted area, and within the existing RCRA secondary containment area.

Containers, with the exception of 55-gallon drums, will not be stacked. Drums will not be stacked more than two (2) high, and will not exceed a total height of nine (9) feet.

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To facilitate container integrity, safety in handling, and storing, containers will be stacked as previously stated to a maximum of two (2) high.

D-2.4 Description of Materials Stored

Only spent activated carbon (SAC) characterized as either hazardous or residual waste will be stored in the containers. All SAC will be dewatered and will contain no free liquids.

D-2.5 Use and Management of Containers. Subchapter D, 75-264q

D-2.5.1 Condition of Containers. 75-265q(1)

Containers are inspected upon arrival at the plant, and as they are being unloaded. If a container is found to be damaged, the contents will be transferred to another container or to storage.

This closer inspection includes verification that:

i. container lids are securely fastened prior to storage,
ii. containers are satisfactory for storage,
iii. any damaged or leaking containers are repaired or the contents transferred to a suitable container, or to a storage tank for regeneration.
iv. all containers are labeled according to source (customer) and material type, and
v. any inconsistencies in the shipping papers are noted.

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Containers in storage will be inspected weekly to ensure that each container is in good condition and is not leaking. If a leaking container is observed, it will be removed from storage and the contents transferred to a container in good condition or the contents will be transferred to existing bulk storage tanks for regeneration. Inspection information is recorded as shown in the attached Fig. A and B. A record of inspection history for all containers will be maintained.

D-2.5.2 Compatibility of Material Stored in Containers. 75-264q(2)

Only dewatered spent activated carbon (SAC) will be placed in containers. Materials adsorbed into the carbon are those listed in Appendix A-2 of the Waste Analysis Plan. Materials of construction for each container are compatible with the SAC placed inside. The SAC will not react with container surfaces so that the ability of the container to contain the waste is not impaired. Many years of field experience in the handling and use of SAC in small containers has led to a container design and specification ideally suited to this purpose.

D-2.5.3 Container Content Accessibility. 75-264q(3)(4)

Containers in storage will always be closed except when it is necessary to retrieve a sample or to remove waste. Containers will be handled and stored in a manner that does not cause a strain or rupture that would cause leakage.

D-2.5.4 Inspection of Containers. 75-264q(5)

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Containers will be inspected upon receipt and weekly as previously described in Part 5a.

The container storage area will be inspected on a weekly basis to ensure that area surfaces are not damaged or cracked and that the containment system is intact. If necessary, temporary emergency repairs will be made until a permanent repair can be scheduled. An inspection record will be maintained.

D-2.5.5 Weighing or Measuring Facilities. 75f-264q(6)

To keep a record of incoming materials, containers will be weighed or a volume measurement will be taken and converted to a weight basis. Appropriate scales and level measuring devices are on site to make these weight determinations. Calgon Carbon service units contain a fixed amount of material and weighing or measuring is not necessary.

D-2.5.6 Incompatible Wastes or Materials. 75-264q(7)(8)(9)

Only SAC will be accepted for storage. SAC in containers will be kept separated and not allowed to mix with SAC in other containers. Pure chemical waste commodities, chemicals, metals, sludges, acids, caustics, cleaners, metal hydrides, oxidizers, and cyanide or sulfide solutions as listed in 75-264q Appendix IV, Groups 1-A and 1-B, 2-A and 2-B, 3-A and 3-B, 4-A and 4-B, 5-A and 5-B, and 6-A and 6-B will not be accepted for storage.

Small quantities of some of the listed organic constituents may be adsorbed on the SAC,

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but these are tightly held in the pores of the spent carbon.

Additionally, as stated earlier, materials in containers will not be mixed and separation of containers in storage is not required.

No transfer of SAC carbon from container to container is planned. Emptied containers will be washed on site, and I) discarded, ii) returned to the generator, or iii) re-used only for the storage of regenerated activated carbon.

D-2.5.7 Containment System. 75-264q(10)(11)(12)

A containment system capable of collecting and holding spills, leaks, and precipitation is in place and fully described in Section F of the RCRA Part B permit. The system has sufficient capacity to meet the requirement of Sec. 75-264q(10)iii.

The proposed container storage area, shown in drawing no. 3.1 and 3.2, will be expanded by moving the existing curb in the northwest corner of the RCRA permitted area to the fence line. Surfaces underlying the container storage area will be repaired as needed. Surfaces will be sloped to allow efficient drainage to the containment storage area.

Curbing is in place to prevent run-on into the containment system. Spilled or leaked wastes and accumulated precipitation are removed from the containment system as described in Section F-4(6) of the existing RCRA Part B permit.

D-2.5.8 Closure. 75-264q(13)

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At closure, all wastes and waste residues shall be removed from all containers, and the containment and collection system. Containers will be decontaminated and taken off site for recycle or disposal.

Part I of the RCRA Part B permit defines closure procedures, closure plan, and cost estimate.

D-2.5.9 Storage of Waste Carbon. 75-264q(14)

All storage of containers will be outside. Only non-reactive and non-ignitable wastes will be stored. Total container height will not exceed 9 feet. Maximum width and depth of a group of containers will provide a configuration and aisle space to ensure access for purposes of inspection, containment, and emergency remedial action.

Process Information/
Thermal Treatment
Section E

E. PROCESS INFORMATION/THERMAL TREATMENT

E-1 General

Carbon regeneration is a thermal treatment process in which adsorbed chemical constituents are removed from spent activated carbon to produce a recycled, reactivated product for beneficial reuse by Calgon Carbon Corporation's customers.

Activated carbon has been used at customer facilities to treat both liquid and vapor streams in a variety of applications including sugar decolorizing, drinking water treatment, water dechlorination, beverage manufacturing, various process purifications, solvent recovery, VOC control, groundwater treatment and wastewater treatment. In use, the activated carbon removes dilute concentrations (mg/L or ug/L) of organic compounds from the liquid and vapor streams to a point where the stream is suitable for reuse or discharge. Organic compounds are concentrated on the internal pore surfaces of the activated carbon by physical attractive forces called Van der Waals forces. The organic adsorbate content of the spent activated carbon loads is limited by the adsorption capacity of the activated carbon. Adsorption capacity is a function of the Van der Waals forces and pore volume for coal-based activated carbons. Restrictions are imposed upon spent activated carbon returns to ensure that no regeneration problems will occur.

Typical spent activated carbon loads returned for regeneration are composed of approximately 50% activated carbon, 40% entrained moisture, and 10% organic adsorbate. The most highly loaded spent carbons contain about 15% adsorbate. The organic adsorbate on a hazardous spent carbon will be described by the appropriate hazardous waste codes as listed in Appendix B.

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E-2 Pre-Regeneration Storage and Transfer

The unloading and storage of spent carbons characterized as hazardous or residual waste takes place within the permitted hazardous waste area. Individual carbon loads are inspected to detect the presence of any sludge, precipitate, free organic, or other foreign materials. To unload the carbon, each bulk trailer is filled with water to create a slurry, and pressurized with air to approximately 15 psi. The carbon slurry is then transferred to one of four Fiberglass Reinforced Plastic (FRP) storage tanks using either compressed air, centrifugal pumps, eductors, or a combination of the respective equipment. These tanks hold the spent activated carbon until regeneration.

The water used to slurry and transfer spent carbon is made up of stormwater and washwater collected from the permitted hazardous waste area, and is stored in the "dirty water" tank (24,000 gallon capacity) for reuse. Treated dirty water is used to quench off-gas from the reactivation process in the evaporative cooler. Excess dirty water not evaporated in the cooler is transferred off site for treatment and disposal as a hazardous waste at a licensed facility.

After trailers are unloaded, the interiors are washed with clean water, and reloaded with activated carbon for transport to a customer site. The washwater flows to an area sump, and is then pumped to the dirty water storage tank.

E-3 Regeneration Process Summary

For reactivation/regeneration, spent carbon slurry is pumped from the storage tanks to a

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11,500-gallon surge tank. From the surge tank, the slurry is pumped to a 160-gallon furnace feed tank. After passing through a dewatering screw, the spent activated carbon is fed to the top hearth (#1) of a multiple hearth furnace. The carbon is then carried down through a succession of seven (7) hearths by means of a rotating center shaft, to which there is attached at each hearth, a series of "rabble arms" which move the carbon alternately toward the outer edge of a hearth where it falls by gravity to the hearth below. The carbon is then rabbled to the inside edge of that hearth where it falls to the next hearth, and so on. The discharge from hearth #7 falls through a chute into the quench tank to be cooled with clean water. The natural gas-fired furnace, having controlled firing on hearths 3, 5, and 7, provides increasingly hotter zones through which the carbon must pass. The optimal operating temperature is approximately 1850 °F with a residence time of 1.5 to 2 hours.

The furnace reactivates the spent carbon by volatizing and destroying the adsorbed contaminants. Dry, reactivated carbon is produced at a rate of 100,000 pounds per day, or 14,892 tons per year. Reactivated carbon exiting the furnace is typically slurried with clean water in a quench tank prior to being pumped to one of four 30,500-gallon storage tanks. Clean water is then used to transfer carbon from the storage tanks to the trailers for transport to customer sites. Alternatively, reactivated carbon exiting the furnace may be cooled using a cooling screw and transferred as a dry product.

E-4 Process and Control Description

E-4.1 Multihearth Furnace

The furnace must be preheated and cured before carbon slurry may be introduced to

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hearth #1, as described in Section E-4.2. When specified conditions are met, spent carbon is received near the center of the top hearth through a flanged connection on the discharge end of the dewatering screw conveyor. As the carbon is deposited on the hearth near the center, the rotating rabble arms and tines distribute the carbon evenly in concentric ridges across the entire hearth. With each revolution, carbon is fed outward in ever-widening circular ridges until it reaches the outer periphery of the hearth where it falls through ports to hearth #2. At this point, the carbon movement is reversed such that the ridges move toward the center shaft in smaller circles until reaching the drop ports located near the center of the hearth. This process is repeated through each hearth until hearth #7, at which point the reactivated carbon falls into the discharge chute. The drop ports serve to distribute the carbon evenly around the hearths, and control waste gas velocities.

Gas flow is essentially countercurrent to the flow of carbon. Hot gases flow from the bottom outer-fed hearth, across the surface of that hearth, and up through the outer drop ports of the hearth above. This zig-zag path continues until the gases reach the top of the furnace. At the top of the furnace, gases are drawn through a fume fan to an afterburner.

Spent carbon is reactivated when impurities ("adsorbate") are driven off and destroyed thermally. To invoke this reaction, the furnace maintains three separate temperature zones through which the spent carbon must pass to become reactivated. The top zone (zone #3) consists of hearths #1, #2, and #3; the middle zone (zone #5) consists of hearths #4 and #5; and the bottom zone (zone #7) consists of hearths #6 and #7. Three burners exist on each of hearths #3, #5, and #7. Each of the burners on hearths #3 and #5 is rated at 1.5 MM BTU per hour, while each of the burners on hearth #7 is rated at 3.0 MM BTU per hour, providing a total rating of 18.0 MM BTU per hour.

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The temperature in each zone is manually controlled by opening or closing the main combustion air valve for that zone. Any change in the combustion air automatically adjusts the fuel valve to maintain a constant air to fuel ratio, thus changing the firing rate to the burners.

Piping is provided for the introduction of steam into the furnace, as required for activation and temperature control on the upper hearths. A steam inlet exists at each burner on hearth #7. Each inlet is individually controlled from the steam station on the ground floor against the northeast wall. Hearth #6 has three steam inlets which are collectively controlled by a single valve and flowmeter against the northwest wall. Hearth #5 also has three inlets collectively controlled by a single valve and flowmeter against the northwest wall. Hearth #2 has a single steam inlet for temperature control.

The afterburner induced draft (ID) fan has a 1200 °F temperature limitation. If the temperature of the gases in the duct leading from the furnace to the afterburner ID fan exceeds 1200 °F, the fan will shut down and vent the furnace gases to the atmosphere. To prevent this from occurring, a temperature-controlled valve is installed on the steam line leading to hearth #2. If the temperature of hearth #1 exceeds 1000 °F (initial setting), this valve will modulate open to prevent the gas temperature from increasing further and shutting down the ID fan. A manual bypass exists at the control valve that remains closed except for control valve failures or other emergencies.

Bypass?

Furnace draft is controlled by positioning of the damper in the duct from the furnace to the ID fan. This damper is positioned by an electrical-pneumatic controller. As a furnace draft is set, the controller compares this setting to the actual draft on hearth #1 and positions the damper to increase or decrease the draft to maintain the setting.

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E-4.2 Start-Up and Operating Procedure

E-4.2.1 Initial Start-Up

To ensure long-life and trouble-free operation, the refractory must be dried and properly cured prior to initial furnace start-up. This procedure may take from several days to two weeks to complete.

All moisture adsorbed by the refractory must be removed before the unit is subjected to temperatures above 212 °F to prevent spalling and cracking of the refractory caused by expanding steam. This is achieved by adjusting one or two burners for "LOW FIRE" to increase the furnace temperature to 250 °F, and maintaining that temperature for four hours after all of the moisture has been driven off.

To cure the refractory, it must be subjected to the temperature at which it will operate. The temperature must be increased slowly to prevent undesired thermal stress caused by rapid increases.

E-4.2.2 Normal Start-Up

All necessary preliminary check out and calibration work must be completed. It must be confirmed that all equipment is working properly. A summary of the normal start-up procedure is as follows:

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- The rotation of the center shaft is initiated.
- The furnace bypass stack cap is opened.
- The combustion air fan is started.
- The main gas safety shut-off valve is opened.
- The main combustion air valves are opened.
- The combustion air valves at the burners on hearth #7 are opened. At this time, the furnace will purge for ten minutes, and the burners can not be lit.
- Upon completion of the purge cycle, the main gas solenoid valve and the main gas blocking valve are opened. At this point, the purge reset timer is started, allowing ten minutes to light one burner (if after ten minutes a burner has not been lit, the furnace must be purged again).
- The main combustion air valve on hearth #7 is set to the "low fire" position.
- The power for burner #7C is switched on.
- The start button for burner #7C is depressed.
- After the pilot light comes on, the fuel valve located at burner #7C is opened. If after 15 seconds the "BURNER ON" indicator is lit, and the "PILOT ON" indicator is not lit, the burner is operating. If the burner is not operating, the fuel valve automatically closes and the "BURNER MALFUNCTION" indicator will be lit.

Lighting additional burners is less complicated, since the furnace does not have to be purged. Additional burners are started through the following procedure:

- The main combustion air valve for the hearth is set to the "LOW FIRE" position.
- The power for the burner is switched on.
- The start button is depressed.

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- The fuel valve at the burner is opened. If after 15 seconds the "BURNER ON" indicator is lit, and the "PILOT ON" indicator is not lit, the burner is operating. If the burner is not operating, the fuel valve automatically closes and the "BURNER MALFUNCTION" indicator will be lit. In this case, the "RESET" button is depressed, and the above steps are repeated.

E-4.3 Shutdown Procedure

The shutdown procedure for the furnace is similar to the start-up in that it must be a gradual, well-regulated, step-by-step process. Just as a sudden increase in heat may damage the furnace due to rapid expansion, a sudden decrease in heat may result in damage due to rapid contraction.

E-4.3.1 Controlled Shutdown

- The furnace feed tank valve is closed.
- The dewatering screw conveyor is allowed to continue running until empty, then stopped. The remaining carbon passes through the furnace and discharges into the quench tank.
- After the furnace is void of carbon to the extent practicable, the furnace temperature is decreased at a rate of 50 °F per hour. When the furnace temperature reaches 400 °F, the center shaft cooling air blower is stopped.
- All main fuel valves are closed.
- The quench tank is cleaned.

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E-4.3.2 Emergency Shutdown

Under the following conditions, the furnace burners will automatically reset to low fire position:

- High temperatures in zone #3, #5, or #7 will reset the burners on hearth #3, #5, or #7, respectively, to low fire.
- Center shaft stops rotating. This will also stop the dewatering screw, which will close the feed valve.

E-5 Air Pollution Abatement Equipment

E-5.1 Summary

The carbon reactivation furnace is currently registered for operation by the Allegheny County Health Department (ACHD) by registration number 1012003 002 81101. An Article XXI Operating Permit Application covering the entire Neville Island facility was resubmitted to the ACHD in February 1997, and is currently under review. The Neville Island facility, including the carbon reactivation process, is characterized as a minor source due to potential emissions of priority and hazardous air pollutants not exceeding designated threshold levels.

Furnace off-gases are treated in an afterburner, an evaporative cooler/chemical scrubber unit, and a baghouse filter. The direct-flame afterburner, with a residence time of

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approximately 0.67 seconds at an average temperature of 1600 °F, provides additional destruction of volatile organic compounds, volatile hazardous air pollutants, and carbon monoxide; typically, near-complete destruction of these pollutants occurs in the reactivation furnace, however. The wet scrubber employs a dilute sodium carbonate solution for removal of sulfur dioxide from the off-gas stream. Finally, a dust collector is in place for removal of particulate matter.

E-5.2 Afterburner

The purpose of the afterburner is to combust remaining organic compounds in the gas stream from the reactivation furnace to carbon dioxide and water. The temperature of the waste gas is raised to 1400 to 1700 °F and retained at that temperature to ensure complete combustion.

The afterburner consists of a refractory-lined combustion chamber with an "in-and-out" hearth-type mixing baffle, a fume fan to draw gases from the reactivation furnace, and two fuel burners.

The afterburner body is a refractory-lined steel shell. Built into the chamber is one in-hearth type mixing baffle and one out-hearth type mixing baffle. These are designed to ensure proper mixing of the fumes from the reactivation furnace with the combustion gases from the burners for more efficient organics destruction. There are two viewing windows on the side of the chamber and two clean-out doors, one below the burners for slag removal from the bottom of the afterburner, and one for slag removal from the top of the mixing baffles.

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Mounted on the side of the afterburner are two fuel burners with individual flame safeguard systems. These burners provide the temperature necessary for oxidation of remaining organic fumes from the reactivation furnace. The temperature in the presence of oxygen converts organics into water and carbon dioxide.

The fume fan provides the draft necessary to draw the vapors from the furnace into the afterburner. In the duct from the furnace to the fume fan is an air pressure-operated draft control damper, which will automatically or manually maintain the desired furnace draft.

The secondary air fan provides extra air (oxygen) for efficient destruction of organics or cooling of the afterburner. During operation, an oxygen analyzer determines the oxygen content of the exhaust gases from the afterburner. The measured content is compared to the desired content as set on the controller, and the appropriate action is taken to increase or decrease the content by opening or closing the exhaust damper on this fan. If, however, during operation it becomes necessary to cool the afterburner, the damper may open to provide this cooling effect regardless of the oxygen concentration.

E-5.2.1 Afterburner Start-Up

As with the reactivation furnace, initial and normal start-up procedures must be followed to ensure that the refractory is properly dried and cured before the afterburner is put into operation.

E-5.2.2 Afterburner Shutdown

The shutdown procedure for the afterburner is a gradual, well-regulated, step-by-step

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process. Just as a sudden increase in heat may damage the furnace due to rapid expansion, a sudden decrease in heat may result in damage due to rapid contraction. In the event of an afterburner shutdown, the process control system is designed to immediately stop feed to the reactivation furnace.

E-5.2.2.1 Controlled Shutdown

- Feed to the reactivation furnace must be stopped for at least three hours.
- The baghouse operator opens the evaporative cooler stack cap.
- A visual check is performed to ensure that the stack cap is open.
- The afterburner temperature is decreased at a rate of 50 °F per hour. Burner "B" is turned off as needed.
- When the afterburner temperature decreases to 400 °F, burner "A" is turned off.
- The combustion air fan is stopped.
- All main fuel valves are closed.

E-5.2.3 Emergency Shutdown

The afterburner shuts down automatically under the following conditions:

- An afterburner flameout.
- An afterburner outlet temperature of 2100 °F or greater.
- Evaporative cooler stack cap failure.

The sequence of events occurring during an emergency shutdown is as follows:

- Reactivation furnace stack cap opens.
- Fume fan stops.
- Fume fan damper closes.
- Dewatering screw stops, causing the feed valve to close.

E-5.3 Particulate Abatement

Hot gases from the afterburner pass through an evaporative cooler followed by a baghouse. Hot gases are comprised of carbon dioxide, oxygen, nitrogen, water, sulfur oxides, hydrogen halides, and particulate matter. Gases are cooled to a constant outlet temperature by a fine mist of water in the evaporative cooler. From the evaporative cooler, the gases pass through a four-module baghouse. An induced draft fan carries abated gases through a stack to the atmosphere. Collected particulates are continuously removed from the baghouse through rotary air locks and into hoppers.

E-5.3.1 Evaporative Cooler

The purpose of the evaporative cooler is to cool the hot afterburner gas stream (1400 to 2000 °F) to a constant outlet temperature of approximately 425 °F, as the bags in the baghouse are not designed to withstand temperatures exceeding 500 °F.

The afterburner exhaust gases enter the top of the evaporative cooler where there is a ring of five nozzles through which water is sprayed. Compressed air is employed as the fluidizing medium. Depending upon the cooling demand, either two, three, or five nozzles will be operating. Water flow rate is regulated by adjusting the water pressure. The degree of atomization is varied by changing the ratio of compressed air to water.

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The water flow rate is controlled by the cooler outlet temperature. The cooler inlet temperature gains control of the water flow rate whenever a spike in the cooler inlet temperature occurs.

Maintaining the cooler outlet temperature at the setpoint of 425 °F is of extreme importance. Temperatures below the setpoint increase the risk of passing through the dewpoint. Temperatures exceeding 500 °F may be responsible for the destruction of the bags in the baghouse.

E-5.3.2 Baghouse

Cooled gases from the evaporative cooler enter the inlet duct of the baghouse and strike the inlet diffuser vanes. Larger particles are directed into the hopper for removal by the ash handling system. The gas is then distributed evenly toward the bags. The gas flows from the outside to the inside of the bags, capturing particulate on the outside. Clean gas is exhausted through the clean air plenum and then through the outlet duct.

Each module has ten diaphagm valves that are actuated by solenoid valves. When the corresponding solenoid is opened, the diaphragm valve assumes the open energized position, allowing compressed air from the header to rapidly blow into a bag. This causes a compressed air "bubble" and corresponding shock wave to dislodge the particulate cake.

When a cleaning cycle is initiated, each module is cleaned sequentially starting with module #1. One cycle is completed after all four modules have been cleaned.

The system automatically determines when a cleaning cycle should be started. When the

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pressure drop across the baghouse reaches the setpoint, a cleaning cycle is initiated. If, at the end of a cleaning cycle, the pressure drop across the baghouse is less than the setpoint, pulsing is stopped. The next cleaning cycle does not begin until either the pressure drop reaches the setpoint, or the periodic time has been exceeded, whichever comes first.

If, after a cleaning cycle has been completed, the pressure drop is not below the setpoint, the system will continue cleaning cycles until either the first setpoint is satisfied, or the pressure drop reaches the second setpoint. If the second setpoint is reached, an alarm sounds.

Depending upon the settling characteristics of the dust, the bags can be cleaned either on-line or off-line. On-line cleaning is performed while the gas enters the module being cleaned. Off-line cleaning is performed while the module being cleaned is isolated from the gas stream.

E-5.3.3 Particulate Abatement Shutdown Procedure

E-5.3.3.1 Controlled Shutdown

Before the particulate abatement system is shut down, the feed to the reactivation furnace is stopped. Secondary air to the afterburner is maintained. The controlled shutdown procedure is as follows:

- The pressure controller is set to manual mode.
- The reactivation furnace is shut down.
- The cooler stack cap is opened. The fan damper is adjusted to maintain a constant

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ID fan amperage.

- The tempering air vent is opened.
- The afterburner and afterburner ID fan are shut down.
- System will automatically shut off the water spray when the cooler outlet temperature is less than 425 °F.
- When the fan inlet temperature is 200 °F, the fan is shut down.
- The air compressor and water pump are shut off.

E-5.3.3.2 Emergency Shutdown

The system is programmed for an automatic shutdown under the following conditions:

- Evaporative cooler inlet temperature is 1400 °F or lower.
- Evaporative cooler outlet temperature is greater than 500 °F.
- Afterburner flameout.
- ID fan shutdown, resulting from high or low pressure at the cooler inlet, loss of power to the fan, or fan overload.

If, for some reason, the process becomes uncontrolled, an emergency shutdown can be initiated manually, invoking the following sequence of events:

- The cooler stack cap is opened. If the stack cap remains closed after five seconds or is not fully opened after thirty seconds, the system automatically shuts down the afterburner and afterburner ID fan, and opens the reactivation furnace stack cap.
- The ID fan is shut off and the ID fan damper closes.
- The tempering air damper opens.

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- Baghouse pulsing is stopped.
- Baghouse poppet valves are closed to the pulse position.
- When the cooler outlet temperature falls below 425 °F, the water to the cooler sprays is stopped.